Preventable amputations in Ethiopia

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Objective: To determine how many amputations might be avoidable in Ethiopia.

Patients and methods: A retrospective study was made of 110 amputations (Male 83, Female 27) performed at the Tikur Anbessa Hospital during the 12 months between May 1 – April 31, 2001- 02.

Results: Upper limb amputations (ULA) were performed for 27 (25 %) of the patients and lower limb amputations (LLA) for 83(75%). Amputation was performed for Trauma (40%), Gangrene of various causes (32 %), Tumour (17 %), and Infections (11%). The majority 64 (58 %) of the amputations were for conditions, which are preventable; these included all of the 27 upper limbs (100%), and 37 of the lower limbs (45 %). Further identification of preventable causes and the implementation of effective preventive measures are recommended.

Introduction

Most amputations in the developed world result from peripheral vascular disease including diabetes, but there are a small number necessitated by trauma, chronic infections, tumours and congenital defects[1,2]. In Ethiopia, vascular disease, apart from diabetes, is less common and amputation is often the only available treatment for the late results of trauma; mainly for late complications, for gangrene of various causes, for tumours and for chronic infections[3].

Many of these amputations could be avoided using public health measures designed to reduce the number of road traffic accidents and industrial injuries, and by improved medical care. This must include education of the public as well as the provision of more adequate medical services throughout the country.

Material and Methods

A retrospective study was undertaken to determine the number of amputations done in Ethiopia that could have been prevented. The study population consisted of 110 patients who underwent major amputation of a limb at our Hospital during a twelve-month period in 2001-2002.

Results

There were 83 males and 27 females. Their ages ranged from 1 to 90 years. Eighty-three (76%) of the patients had their lower limbs removed and 27 (25%) had upper limb amputation (Table1). *Trauma* accounted for 44 (40%) of cases. Other indications for amputation included *Gangrene* due various causes in 35 (32%), *Tumours in* 19 (17%), and *Chronic Infections* in 12 (11%). Tables 2-5 summarize the results. Of the 44 patients in the *trauma* group, 20 were victims of a road traffic accident, 5 were injured by a machine, while the other 19 were due to various others causes (Table 2).

Among the 35 patients who lost their limbs as a result of *gangrene,* 24 had vascular insufficiency of which nearly 11 were associated with diabetes. In two children, amputation was done for gangrene that followed application of a traditional splint, and in one gangrene resulted from a 'medically applied' tight plaster cast (Table 3). Nineteen limbs were removed for *tumours*, which had presented at a late stage, and for which neither radiotherapy nor chemotherapy were available (Table 4).

The *infection* group of 12 patients was comprised of 6 with chronic haematogenous osteomyelitis, which had defied the available surgical and medical management. Only two followed chronic infection of a compound fracture, but four amputations were performed for life threatenening gas gangrene, which had complicated a compound fracture [Table 5].

Table 1: Causes of major limb amputations at Tikur Anbessa Hospital.

Types of amputation	Causes of amputations				Total
	Trauma	Gangrene	Tumor	Infection	
ULA	24 (22%)	3 (3%)	-	-	27 (25%)
LLA	20 (18%)	32 (29%)	19 (17%)	12 (10%)	83 (75%)
Total	44 (40%)	35 (32%)	19 (17%)	12 (10%)	110 (100%)

Table 2: Distribution of amputees by sex and specific causes of trauma.

Causes of trauma	**Sex**		**Total**
	Male	Female	
Road traffic accident	16 (36 %)	4 (9%)	20 (45 %)
Machine injury	5 (11 %)	-	5 (11%)
Fall accident	3 (7 %)	-	3 (7 %)
Bullet injury	3 (7 %)	-	3 (7 %)
Hit by falling stone	2 (5 %)	-	2 (5 %)
Train accident	2 (5 %)	2 (5%)	4 (10 %)
Burn	2 (5 %)	2 (5%	4 (10%)
Blast injury	1 (2%)	-	1 (2%
Hit by stick	1 (2 %)	-	1 (2%
Hit by mencha (Sickle)	1 (2%)	-	1 (2 %
Total	36 (82 %)	8 (18%)	44 (100 %)

Table 3: Distribution of amputees by sex and causes of gangrene

Causes of gangrene	**Sex**		**Total**
	Male	Female	
Vascular insufficiency with DM*	7 (20 %)	4 (11%)	11 (31%)
Vascular insufficiency without DM*	8 (23 %)	5 (14 %)	13 (37%)
Diabetic	3 (9%)	2 (5%)	5 (14%)
Bamboo splint	1 (3%)	1 (3%)	2 (6%)
Tight cast	1 (3%)	-	1 (3%)
Peripheral emboli (CHF with MS**)	-	1 (3%)	1 (3%)
Unknown cause	1 (3%)	1 (3%)	2 (6%)
Total	21 (60 %)	14 (40 %)	35 (100%)

Table 4: Distribution of amputees by Sex and types of tumour

Types of Tumour	Sex		Total
	Male	Female	
Osteosarcoma	6 (32%)	1 (5%)	7 (37%)
Squamous cell carcinoma of the foot	4 (21%)	-	4 (21%)
Malignant Osteoclstoma	3 (16%)	1 (5%)	4 (21%)
Ewing's sarcoma	2 (10%)	1 (5%)	3 (15%)
Melanoma of the foot	1 (5%)	-	1 (5%)
Total	16 (84%)	3 (16%)	19 (100%)

Table 5: Distribution of amputees by sex and types of infection

Type of infection	Sex		Total
	Male	Female	
Chronic osteomyelitis	6 (50%)	2 (17%)	8 (67%)
Gas gangrene	4 (33%)	-	4 (33%)
Total	10 (83%)	2 (17%)	12 (100%)

Discussion

This study thus confirms that at the present time about a half of the limbs being amputated at our Hospital (and probably throughout Ethiopia) could have been saved, or prevented by relatively simple means. These include reducing the number of road traffic accident casualties by improving roads (design, construction, complete separation of pedestrians from vehicles, etc.), traffic education of drivers and the public in general, together with the establishment and enforcement of health and safety measures at work, e.g. machine guards, protective hats, clothing and shoes.

Chronic infections can be prevented by the early diagnosis and better treatment of acute infections and of open fractures. Similarly the early diagnosis and appropriate management of malignant tumours would lessen the number of patients requiring amputation.

The inappropriate use and care of splints (both bamboo and plaster) in the management of fractures should be reduced by better education of Medical Staff and Traditional Healers. It is noted that the reasons for amputation in this series are very similar to those recently reported by Yinusa and Ugbeye from Nigeria[4].

Conclusion

Identification of these preventable causes and introducing effective measures to correct them would prevent disability, promote development and productivity of the family and community, and thus contribute to the poverty reduction of our country. This demands increased awareness and activity from all those concerned including the Government, as well as an improvement in the economic state of the Country.

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